

# SURVEY OF HISTORICAL SITES LITHGOW AREA

190/93

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## CHAPTER 8: BLAST FURNACE, COKE OVENS, GASWORKS, POTTERY, BRICKWORKS, WOOLLEN MILLS, BREWERY

### BLAST FURNACE SITE

LITHGOW

#### Historical notes

Blast Furnace 1 (75 feet high x 19 feet diameter) with its 4 Cowper stoves of similar height to preheat the pressurised air, was built between March 1906 and April 1907, when it was blown in. The great engine house was built simultaneously, with a pump house annexe to the east and a turbine annexe to the south. The Parsons turbo blowing engine was it seems, the first steam turbine engine in Australia. The other original engine was a Davey vertical single cylinder tandem blowing engine.

The coke bins in the raw materials gantry were also built by Sandford on the west of the blast furnace; the gaunt brick walls still stand, but the timber back of the bins has long since disappeared.

In September 1906 the first railway siding was opened off the Dump Road of the Coal Stage (the now demolished coal-loader) to facilitate the building of the complex and thereafter to service the works. There was no direct rail link between the Blast Furnace and the Steelworks until 1914.

In 1913 Hoskins built a second blast furnace to the north of No. 1 furnace, to a very similar design, again with 4 Cowper stoves. This created the need for more power and the engine-house was expanded by a south extension to the turbine annexe for another Parsons engine. It is likely that there was already a second Parsons engine as stand-by: certainly there were 3 by 1925.

Simultaneously the 80 Belgian coke ovens were built, the gantry crane was installed and in 1914 a long extension to the railway system joined the Blast Furnace at last to the Steelworks. This railway ran from the coal stage down to a new (and surviving) bridge over Inch Street, curved to avoid Eskbank and crossed Union Street and Tank Street on level-crossings. Another track, opened in 1913 went to the coke ovens in Oakey Park, crossing the Zig Zag Colliery's siding, again on the level. The sidings were lifted in 1928.

Further extensions took place in the engine-house area in 1919 and finally in 1923, when the largest steam engine ever built in Australia, a Thompson horizontal compound tandem blowing engine, was installed. This 1923 brick facade had 3 narrow windows and a circular ventilator in the gable: the following year a matching brick facade was built on an east extension of the 1913 turbine annexe and this is very clear in the Black Book distant view of the works (p. 39).

Historical notes - Bibliography

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Sir Cecil Hoskins, The Hoskins Saga, Sydney 1969.

R.F. Wylie and C.C. Singleton, "The Railway Crossing of the Blue Mountains, 7 Lithgow", Australian Railway Historical Society Bulletin, n.s. X no. 259, March 1959, pp. 33-44.

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Illustrations: exceptionally rich.

Hoskins "Blue Book" 1915.

Hoskins "Black Book" 1925.

Set of Sandford's photographs of the building of the engine-house and furnace No. 1 1906-7 in Mitchell Library MS 1556.

Hoskins, The Hoskins Saga.

Essington Lewis, Iron and Steel Industry in Australia, 1929 (State Library of N.S.W., General Reference Library Q 672.05/4).

Plan and elevations of present remains in Schulstad thesis (above).



### Blast Furnace Site

A dyeline copy of a plan of the Blast Furnace site is extant. The plan is not dated. It does, however, show the No. 1 blast furnace in detail and the No. 2 blast furnace as an outline only. It may, therefore, be presumed that the date of the plan is approximately contemporary with the building of blast furnace No. 2.

Individual features on the plan were sequentially numbered and an attempt made to locate their material remains. A description of these remains follows.

The dyeline copy is somewhat indistinct and in some cases it was rather difficult to establish the form of individual units. The general area of features suggested on the plan was searched in this case and all structures were recorded.

Dr Rollason and his associates in the Railway Society have drawn up a clarified version of the dyeline copy. This is also included in the report but was not used on site.

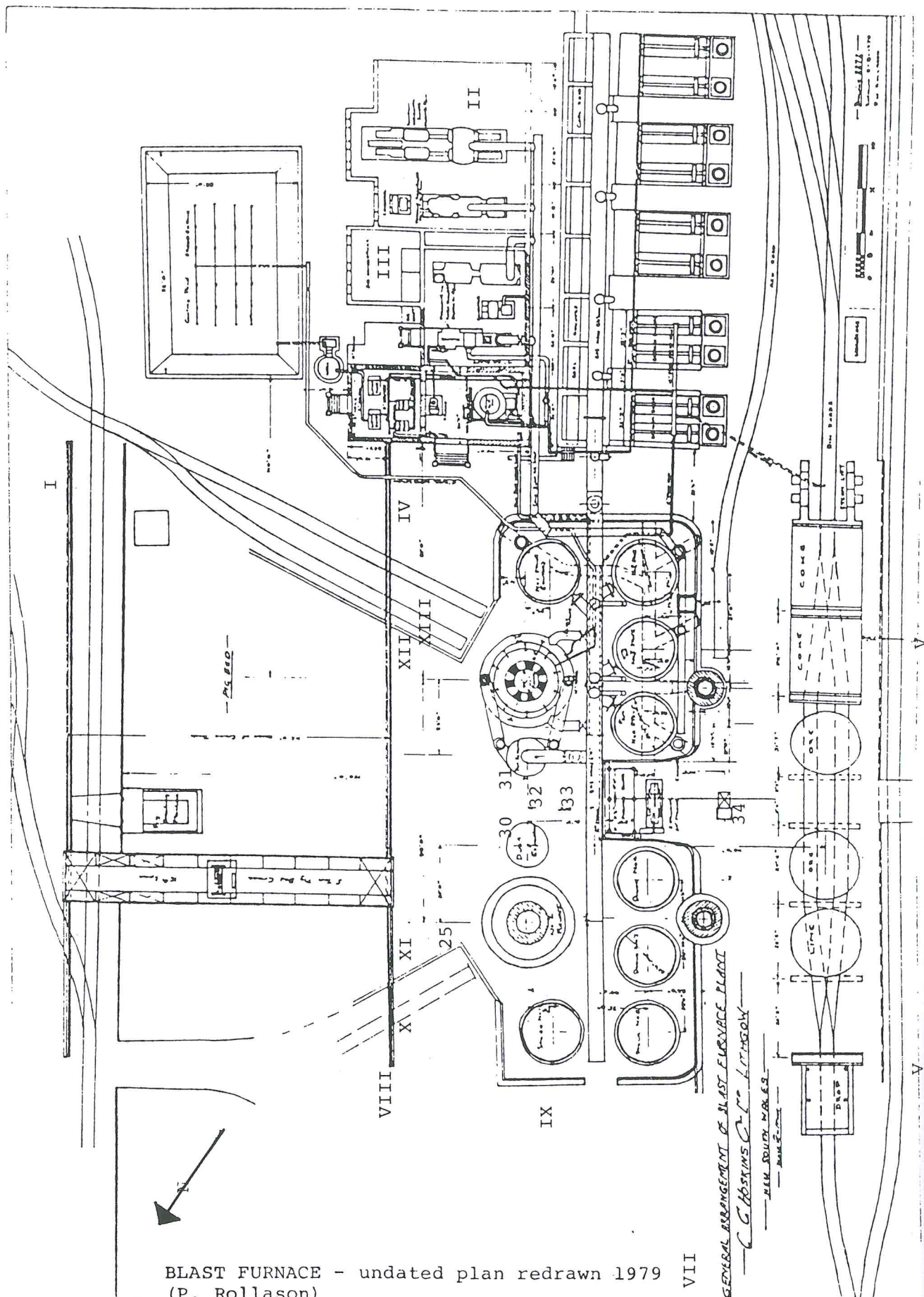
Several features were found on the ground which were not included on the plan. These are recorded in a separate section. Their approximate position and arrangement and the numbered key are shown on a second copy of the plan.

Mr Mal Humble, who is an engineer at the Wallerawang power station and familiar with the workings of modern blast furnaces, accompanied me on a tour of the site. While he was not able to explain details of operation of this blast furnace site he did confirm most of my suppositions regarding the identification of ground features to those shown on the plan.

Mr Humble remarked on the occurrence of the 4 stoves associated with each blast furnace. According to him most blast furnaces today have only 3 stoves. He suggested that of the 4 stoves only 2 may have been used to heat the air passing to the functioning blast furnace while the other 2 were being cleared out.

The plan with numbered features is attached. Sketches where appropriate are included in the text.

1. The major part of this building is no longer extant. The brick foundation walls and the floor within these are the sole remains. The floor is of rendered brick with a red wash surface. A comparatively extensive part of the floor comprises machine pits. A gabled roofline of the former building is visible on the building described as feature 2. The ground level in front of the building has recently been built up and the steps in front of it and the outlet pipe and well to which it leads are either below the level of this fill or no longer extant.



BLAST FURNACE - undated plan redrawn 1979  
(P. Rollason)

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## GENERAL ARRANGEMENT OF SLAT FURNACE PLANT

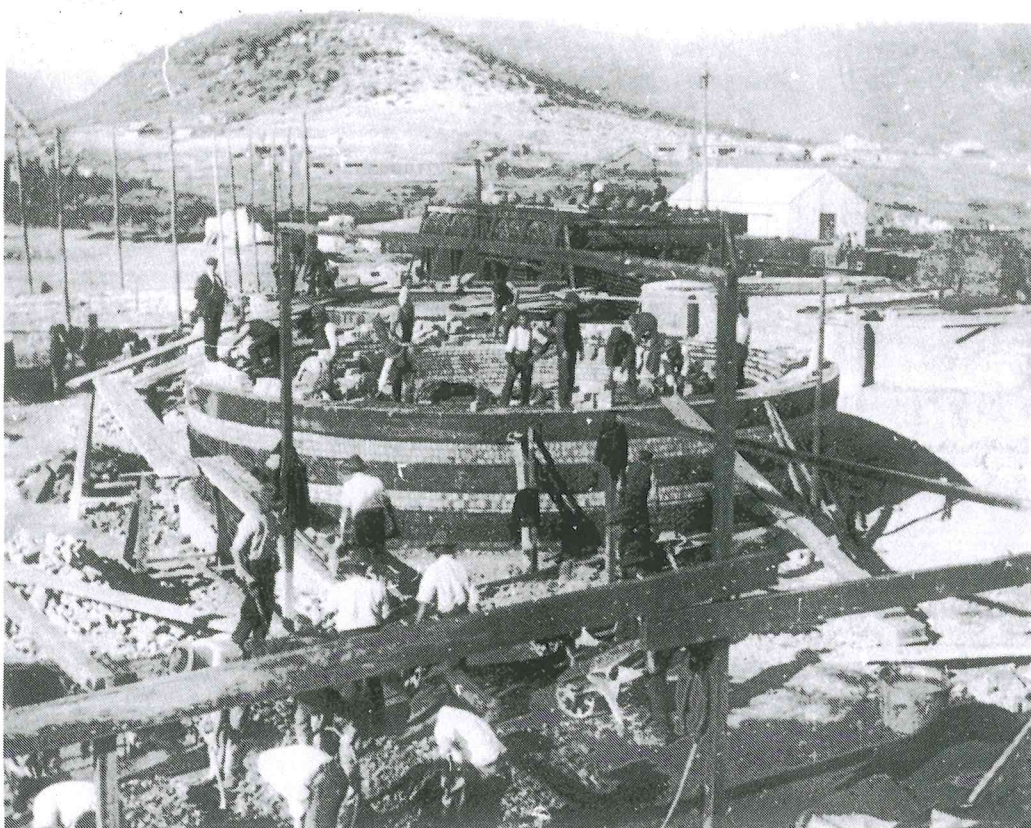
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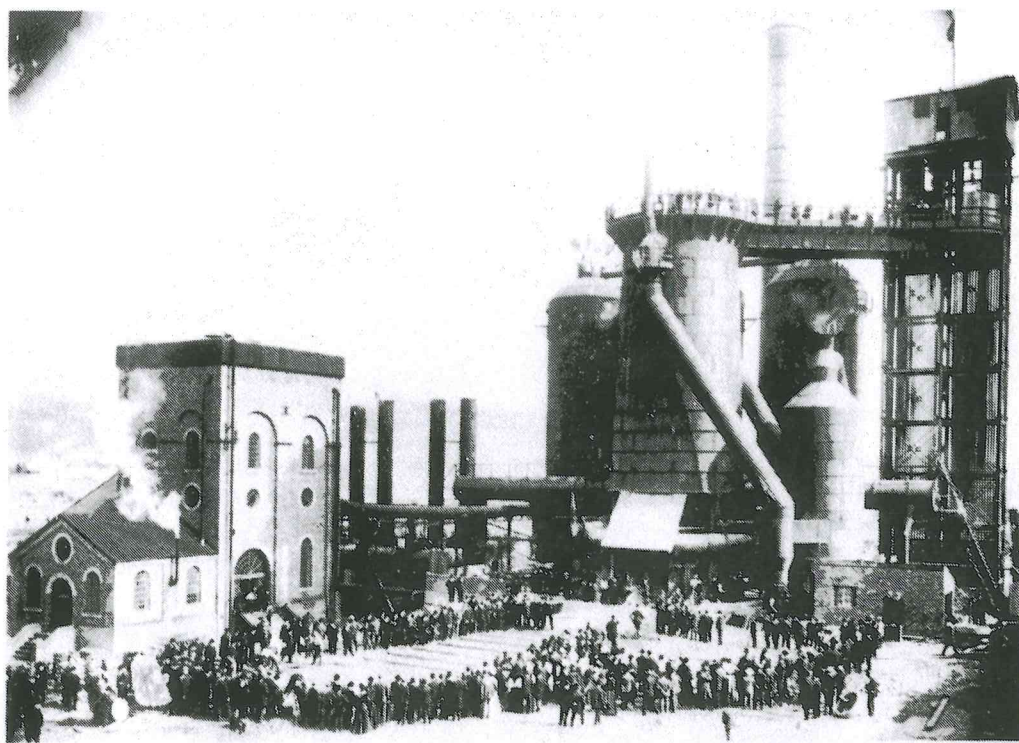
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with additional features I-XIII and 30-34 (as visible Nov. 1985)



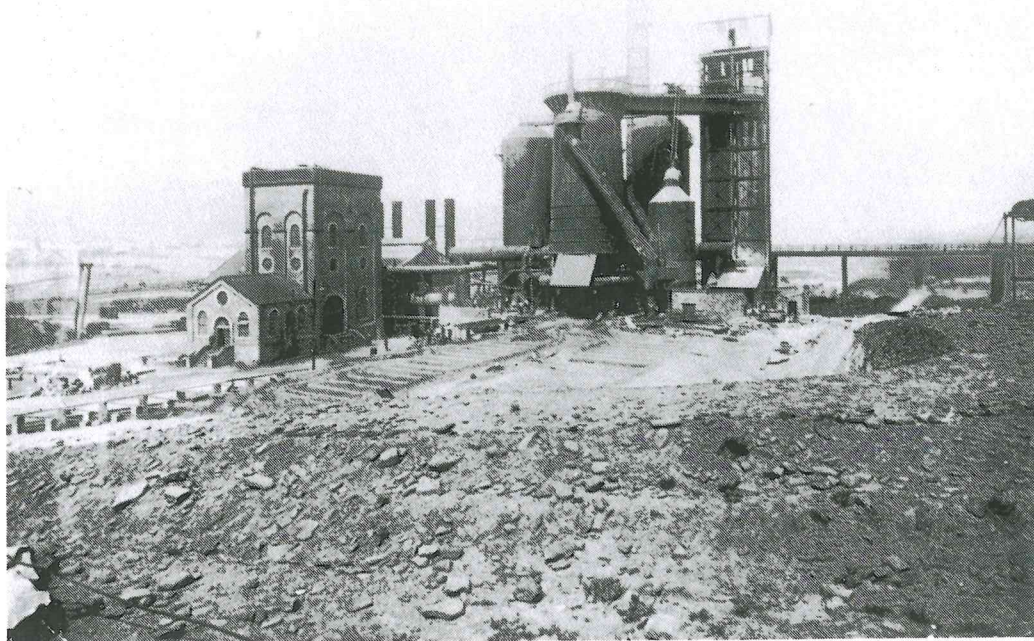


Construction of the Blast Furnace (1906). Mitchell Library Sandford Papers.

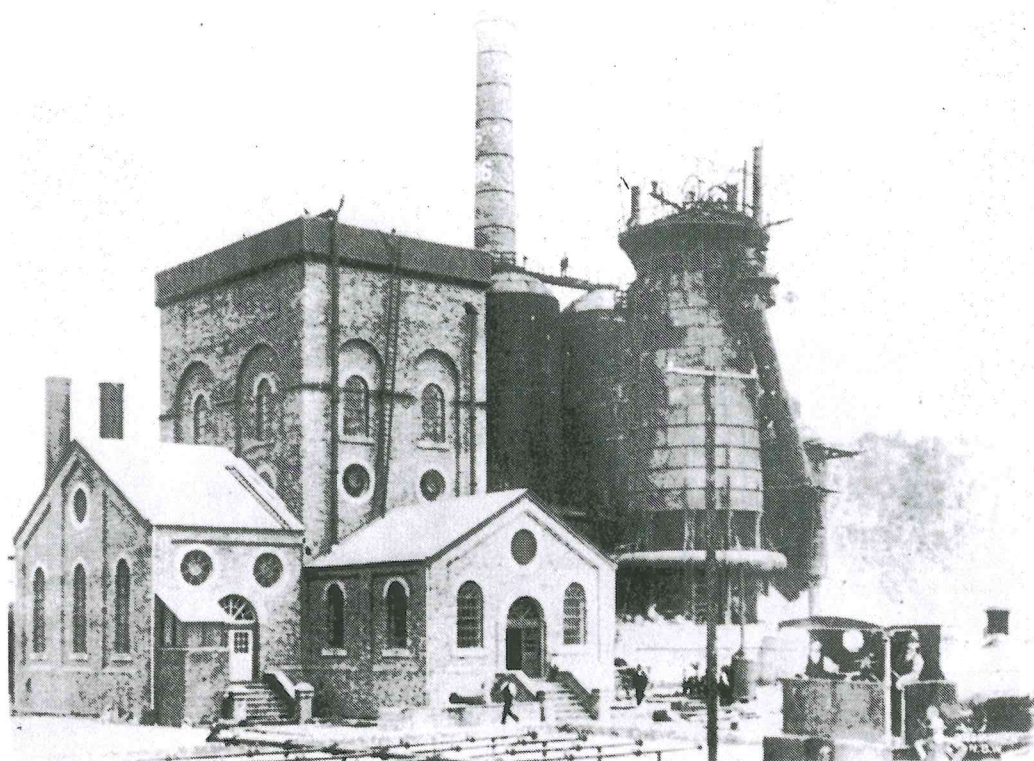


The opening of Australia's first modern steelworks, Lithgow on 13 May 1907. Ruins of the Engine House and foundations of the Blast Furnace and salamander still exist. Photo: held in Lithgow Regional Library.





Blast Furnace (note the pig beds in the foreground).  
Photo: Government Printer Star Series 3315.



Blast Furnace and locomotive.  
Photo: Railway Archives.



2. This building is an engine-house of mid-brown brick; cream-coloured bricks trim the various openings. The roof is entirely missing. The east facade has two arched doorways (without doors) at ground level, two circular window openings at mid-level and two arched window openings at the top level. The west facade has two arched windows at ground level, one of which is now blocked, and above these a similar arrangement to the east facade. The north elevation has a very large arched doorway and an arched window at ground level. At mid-level are two circular windows similar to those on the other elevations. At the top level are the remnants of two arched windows, the upper portions of which are missing along with that section of wall. The south elevation has a very large door opening and an arched window on the ground level. At the middle level are two circles which are now blocked. At the top level are two arched windows. None of the openings appear to have contained window glass or doors. A set of steps is located outside the large opening on the north side of the building.

Within the building, at floor level, gaps for bearers are visible. Neither bearers, joists nor floor boards are extant. Below this level the building walls drop approximately 3 metres. The base of this area appears to be the natural soil cover. Within this area are several brick piers which are presumably bases for the engine. Above this level a 31 centimetre deep band of concrete render runs around all walls. Above this is an area of tiled wall which is 1.20 centimetres deep. Topping the tiles are indications of a former dado in the form of an unpainted strip within which are occasional timber plugs. The walls above this are covered with what appears to be calcimine. The top layer is of a relatively bright blue but where the surface has flaked the earlier colours, pink, pale blue and white can be seen.

The following features, i.e. the remnants of the blast furnaces and associated stoves, are on ground level which is some 2 metres higher than the ground level adjacent to the engine-house. This latter ground level slopes gradually towards the western extremities of the site whereas the ground level in which the furnaces and stoves are apparent drops very sharply immediately beyond the stoves. The drop at this side is some three and a half metres.

The ground levels throughout the whole of the blast furnace site have obviously been altered considerably at various stages. Construction of the various structures is responsible for some of the alteration, and demolition and removal of the same structures for even further alterations. Quite recently some attempts have been made to fill in and flatten out parts of the site.

3. The only visible remains of this feature, which according to the plan is one of the four associated stoves for Blast Furnace No. 1, is a concrete surface. The edges of the concrete are overgrown and damaged. Although ill-defined,



the shape of the concrete is approximately circular with a diameter of about 1.5 metres. The stoves were used to heat the pressurised air which was created by the blowing engine before it went into the blast furnace.

4. According to the plan this is the area of Blast Furnace No.1. Partial foundations and slag only are visible. These consist of a brick circle some 5 metres in diameter set centrally within a circular depression of somewhat larger diameter, the brick circle being visible to a depth of approximately 7 courses of brick. The base of the depression is overgrown and filled with rubble. The top of the brick circle consists of a layer of iron slag. The outer face of the brick circle is marked throughout by metal corrosion. A single metal pipe which appears to be fixed occurs in the depression. Outside the gap an uneven edging of brick occurs on the western side. Just beyond this begins a heap of brick rubble.
5. This feature is another of the stoves, its probable location was a heap of brick rubble.
6. For this feature the only visible remains was a concrete surface. Like the previously mentioned concrete, the edges of this surface were rather ill-defined although the area extant was greater than in feature 4. The concrete was in this case approximately a rectangle measuring some 2 metres by 1 metre.
7. In this case not only the concrete surface is visible but also the base of the feature in a depression in the ground alongside. The concrete is a platform some 20 centimetres deep. Again the edges of the feature have been disturbed so the true dimensions are not available. On the top of the platform are traces of a brick superstructure. The foundations consist of 4 (visible) brick piers of varying depths.
8. According to the plan this is the site of Blast Furnace No.2. On the plan this blast furnace is shown as an outline only. Perhaps it had been planned but not constructed at the time the dyeline copy was made (1912?).

The remains are circular in form. The diameter is 4.5 metres. The outer edge is formed of metal plates. These appear to be steel although they could possibly be iron. Within this circle is a layer of iron slag. To either side of the feature are two semi-circular segments of a slag skull which give the impression of having fallen directly from the circular feature. Outside the eastern extremity of the circle are the bases of two metal pillars and traces of what might be others.

9. On the plan this feature is named as one of the stoves attached to blast furnace No. 2. On the ground the only traces are those of a brick platform. The shape is quite indeterminate but is very approximately 2 metres in length.
10. On the ground the only suggestion of a former structure is the very uneven and somewhat raised ground surface.
11. Area is similar to that noted for feature 10.
12. Again the same uneven ground surface.

According to the plan this whole area designated above as features 10, 11 and 12 is the site of the remaining 3 ovens attached to furnace No. 2. While there is no trace of a structure for any of the 3, the uneven nature of the ground does appear to form 3 discrete areas which may therefore be reasonably supposed to correspond to the former sites of demolished stoves.

12. Both on the plan and on the ground this feature would appear to be the chimney associated with the group of stoves for No. 2 blast furnace. It is a circular brick feature which is only partially intact. It has a diameter of approximately 4 metres and is approximately 15 courses high. The brick sides slope gradually inwards. Although this inclination was not measured it did appear to be too sharp to be continued to the height of some of the chimneys appearing in photos of the site. A chimney attached to 4 stoves might be supposed to be of a considerable height since it would presumably have been acting as a draft creator as well as outlet.
14. No wall as depicted on the plan exists. This area is, however, the point at which the level drops some 3 metres. At the lower level is a feature which in the plan appears as the following outline:

The materials used are brick and, in one area, concrete blocks. This latter section may have been an addition. The whole structure is extremely overgrown and thus rather inaccessible but certainly appears to consist of more than a revetment wall. It appears possible that this is the western extremity of a large foundation area for the group of stoves and the associated chimney and flue system. Several small arched openings occur in the facade.

15. On the plan another chimney and revetment wall are shown. On the ground this feature is physically separated from feature 14 but similar to it in form and alignment and is also constructed of brick. Its arrangement is somewhat broken down but it does not appear to have formed a continuous line with feature 14. It may be that this is the foundation for a chimney associated with the stoves of blast furnace No. 1. No signs of the posited chimney were visible at the upper level.



16. A freestanding brick wall, the width of which narrows from base to top. The wall is buttressed on its south face:

The face of this brick buttressing has two very eroded strips running lengthwise down the wall. At the base of the north face of the wall are three low walls or foundations. These form a rectangle to the main wall:

A concrete footing is barely visible in the north-west corner of the rectangle and two brick footings or possibly buttresses occur on each of the east and west walls. The area within the rectangle is filled with pieces of timber and sheets of corrugated iron. Running up the north face of the main wall, from its base to approximately two-thirds of its height are small gaps which suggest seating for bearers but which are separated by only three brick courses.

On the plan this feature is labelled as "drop". This is apparently part of a system used for filling the nearby storage bins via the steamlift nominated on the plan and overhead lines or rails.

- 17-21. Of this whole group of features the only remains are two freestanding brick walls and a row of concrete footings. The plan suggests an original arrangement of storage bins and retaining walls.

The two walls are parallel to one another and run east to west. The outside facade of the northernmost wall has a row of six gaps which appear to be seating for bearers. These occur approximately one-third of the way up the wall. This facade is very eroded. The eastern end of the wall has been buttressed with concrete.

Running between the two freestanding walls is a row of concrete footings.

22. This feature is labelled "steam lift" on the plan. No structural remains are currently visible although there is an extensive heap of brick rubble in the area. Intermingled with the bricks are metal pipes and parts of metal fittings.
23. No structural remains of the feature labelled "weighbridge" on the plan. Small patches of rubble exist around the area in which this would have been located.
24. This group of features probably represents boilers, boiler housing and associated chimneys. It is rather difficult to determine how many are represented on the plan, whether the actual number shown is correct or whether the fainter representations are faults of the copying process. Whichever is the case, very little is to be seen on the ground in this area. The ground surface is very uneven and small patches of brick rubble occur throughout.

A few pieces of railway line were found in this area. Both segments were lying loosely mixed with rubble.

25. It is not clear either from the plan or from the site evidence whether this outline should be interpreted as a discrete feature. What physical remains there are could be identified with either this feature or with feature 26 since there is definite correspondence between the remains and the lines on the plan. The positioning of the physical remains was checked only approximately but again it was possible to see these probably fragmentary remains as being either feature. If these planned lines are to be seen as a discrete feature then they may correspond to feature 28 as being the outer revetments of a large general area forming the location of the pig bed or beds. The label "pig bed" on the plan suggests that the whole area may be intended to be thus described. The fact that a unit labelled "5 ten pig bed crane" is located within the general area does not detract from this argument. Different beds are likely to have occurred not only to cope with different mouldings of iron but to take the run-off of slag as well.

The material remains consist of two brick walls running approximately at right angles to one another. The first wall runs north-south for a length of 5 metres and forms a revetment for the raised ground levels of the stove/blast furnace area. The second wall runs approximately east-west for 18 metres approximately but is slightly curved inwards. Its eastern end is now covered by a heap of coal/soil? The area within the angled walls forms a type of bay set at a lower level than the ground outside the walls. The junction area of the two walls is covered by a loose spill of bricks which appear to have come from some structure set above the walls.

26. See No.25 above. However, no second set of remains are present on the site.
27. Again it was not entirely clear which material remains related to the planned feature. However, it is rather more likely in this case that this plan feature corresponds to the following remnants. These consisted of two parallel brick walls which are presently 9 metres long and 2 metres in height. Again their eastern end was obscured by a loose deposit. A distance of only 30 cms separated the two walls. The top surface of both was concrete rendered.
28. Again it is difficult to determine from the plan exactly what this feature represents. On the ground there is no structure to correspond with the outline on the plan. A certain amount of rubble, mainly brick, occurs in the general area but it is not particularly concentrated.
29. The plan labels this feature as the cooling pond. No trace of it is to be detected on the ground. As noted previously this whole area has now been levelled and filled in.

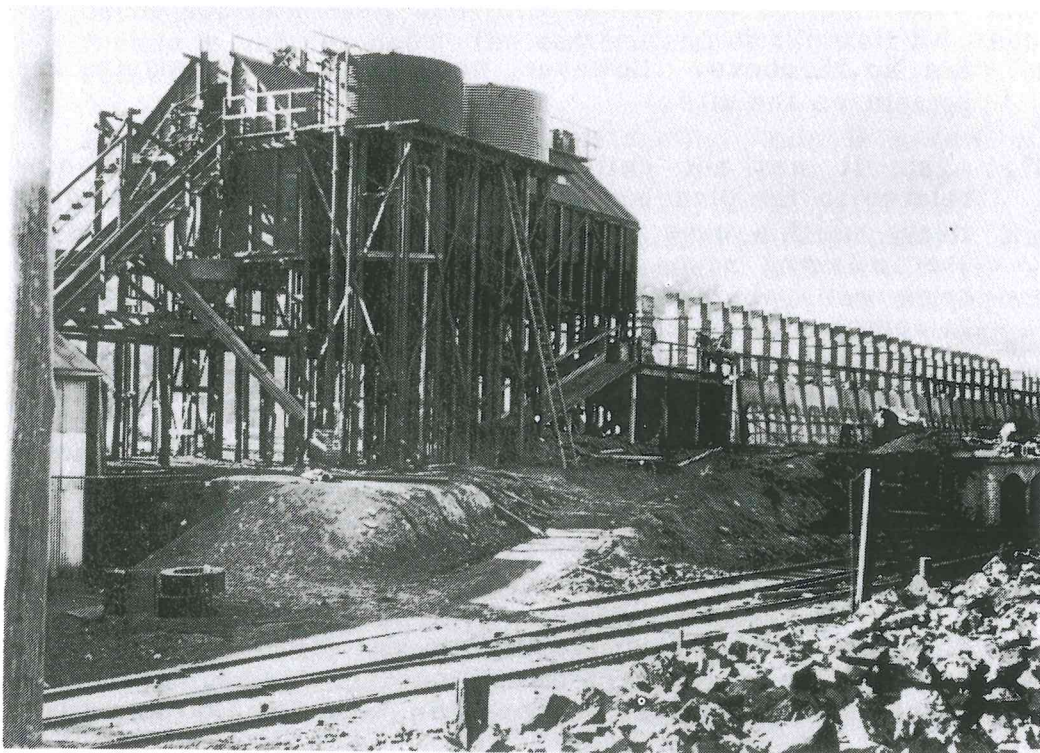


## BLAST FURNACE COKE OVENS

Remnants of a bank of coke ovens in the Lake Pillans area of Lithgow corresponds to an extant photograph and plan nominating the ovens as part of the Hoskins Blast Furnace system.

Remnants of ancillary structures also exist on the site but are not shown by the plan or the photograph. The plan is not a detailed one and shows the coke oven embankment as a schematised block only.

The site can be approached from two directions. At the beginning of the Bells Road just beyond the railway bridge is a workshop-garage. The site lies behind (south of) the grounds attached to this workshop. Alternatively, an unsealed road runs beside the main railway line and close to the alignment of oven embankment and ancillary structures. The alignment runs east to west and the most substantial remnant - the arched platform on which the ovens were built is directly in line with the Zig Zag winding house to the north. Located on, and to the rear of, the platform is an area of brick rubble remains of some of the coke ovens. Approximately some 120 metres from the platform area is a single extant wall of what would appear to be the end oven of the coke oven bank. To the west of this wall are the relatively intact remains of the boiler housing, foundations which are probably for a gantry and a sizeable brick revetment around a type of bay.



Blast Furnace Coke Ovens (note the platform arches).  
Photo: Department of Mineral Resources.



The coke oven platform is constructed in a dark brown brick with a concrete render on its upper surface. The base of the platform consists of structural arches, 12 of these arched cavities currently being visible. The back of the individual areas is formed by a solid brick wall. Some of these walls contained a cavity which might be a flue related to the oven system. Since several of the 12 arched areas are very overgrown with brambles and therefore not readily accessible, it was not possible to determine the frequency of the "flues" within the 12 areas. Where they could be checked, an area with a "flue" was adjoined by 3 without flues then by one with a flue. As well as these relatively sizeable cavities, which may represent flues, all of the rear walls appeared to have occasional gaps to the size of a single omitted brick. This feature was checked in the recorded area (see plan and sections over) and found to be only one brick deep with a solid (brick?) backing.

At the rear of the platform arches, a small channel has been cut into the ground. Its back is formed by the continuation of the rear platform wall and its front is also brick faced. It was probed but did not appear to have a brick base, rather the base is formed by several centimetres of silt. The channel continues from one arched area to the next and it seems probable that it carried the overflow of water which was used on the platform above to quench the coke after its firing. Such quenching is portrayed in the photograph of the site.

The front of the platform is within a cutting which probably housed the railway siding utilised for the transport of the coke. Such an arrangement can just be seen in the aforementioned photo and was a normal method of unloading the more efficient type of coke oven system. Part of the cutting in front of the extant platform is filled with chitter and to either side of the platform area the cutting has been filled so as to be no longer visible.

The rubble remains of the coke ovens consist of whole bricks, part bricks and completely crushed bricks. Some of the rubble is formed of individual heaps presumably corresponding to oven units, but some of it is a single amorphous area. No attempt to count individual ovens was made but it was at least obvious that the remnants did not represent anywhere near the 90 ovens mentioned on the photograph caption. The rubble tends to fade away towards its western end leaving a considerable gap before the extant single wall mentioned above. However, the rubble remnants, the gap, and the single wall may well equal the area of the reported 90 ovens.

The single brick wall runs north-south. It appears to be constructed of silica bricks and has a slight structural inclination inwards. It also appears to be the end wall of the coke oven embankment.



Immediately to the west of this wall is an alignment of metal fittings visible on the ground surface. These lead towards a set of concrete footings which may have formed the base for the gantry system part of which is shown in the photograph. This system was one in which an overhead line was used to raise and lower the doors for the individual ovens.

The housing for the boiler consists of two parallel brick walls and a single end wall with circular opening. Attached to the structure is a brick chimney base with a ground level flue/firing hole.

The revetment wall occurs in relation to a type of "bay" - an area of ground apparently deliberately recessed and at a much lower level than the surrounding ground level on which the aforementioned structures occur.

Mr Bede Wilson, a local informant who accompanied me to the site, suggested that since this inlet is quite close to the site of what was once Lake Pillans it may in fact have held water from that source to be utilised for the coke oven site. The boiler would of course have required supplies as would the hose system for quenching the coke. The boiler would probably have supplied the motive power for the gantry and possibly other equipment.

#### RECOMMENDATIONS

The rubble of the coke ovens is very much overgrown by brambles and at least part of the alignment appears to have been totally removed, possibly during a clearing operation for the adjacent railway area. The remnants that do exist appear to be much less intact than those at either the Vale Colliery site or the Oakey Park site. Little information would, we feel, be gathered from a physical investigation of the remains. A representative selection of bricks might be worthwhile task considering the peculiar nature of the bricks at the Vale coke oven site and the special needs of coke oven construction.

The platform may eventually be lost to view if the depression in front is further filled but generally, it could be said to have been sufficiently recorded at this time. It may be thought worthwhile to pinpoint the exact location of this segment of platform since it is not necessarily the case that the rest of the buried line of platform remains intact.

As for the ancillary structures, the boiler housing, the gantry base and line and the revetment wall, we think that these should be planned in detail, providing that no further plans become known. While the structures do not appear to be under any immediate human threat, they are all rather fragile and exposed and will gradually suffer depredations from the elements.

Any compilation of information from this site would provide a valuable complement to work already done at the Vale colliery site and to any information extracted from the Oakey Park site.





Google earth

feet  
meters

1000  
300



LITHGOW BLAST FURNACE SITE